CLAIM AMENDMENTS

<u>IN THE CLAIMS</u>

This listing of the claims will replace all prior versions, and listing, of claims in the application or previous response to office action:

1.   **(Currently Amended)** A method of calculating fuel flow adjustments for balancing combustion among cylinders of an internal combustion engine, comprising the steps of:

measuring the peak firing pressure within each cylinder;

measuring the ~~combustion~~ <u>compression</u> pressure within each cylinder;

for each cylinder, calculating its associated normalized peak firing pressure (NPFP) as the ratio of its peak firing pressure to its ~~combustion~~ <u>compression</u> pressure;

<u>**determining a balancing NPFP, the balancing NPFP being between the smallest calculated NPFP and the largest calculated NPFP, thereby**</u> determining a target NPFP for the engine;

comparing the target NPFP to the NPFP for each cylinder; and

calculating a fuel flow adjustment to any cylinder whose NPFP is not substantially equal to the target NPFP.

2.   (Original) The method of Claim 1, wherein the step of measuring peak firing pressure is performed by measuring peak firing pressures for a number of cycles and averaging over those cycles.

3.   **(Currently Amended)** The method of Claim 1, wherein the step of measuring ~~combustion~~ <u>compression</u> pressure is performed by measuring combustion pressures for a number of cycles and averaging over those cycles.

4.   **(Currently Amended)** The method of Claim 1, wherein the step of calculating each cylinder's NPFP is performed by calculating an average of ratios of its peak firing pressure to its ~~combustion~~ <u>compression</u> pressure.

5.   (Original) The method of Claim 1, wherein the target NPFP is the mean of the NPFP values calculated in the calculating step.

6.   (Currently Amended) The method of Claim 1, wherein the ~~calculating, determining, and comparing~~ **determining, comparing, and calculating** steps are performed by a computer, and further comprising the step of displaying the results of the measuring steps on a computer display.

7.   (Currently Amended) The method of Claim 1, wherein the ~~calculating, determining, and comparing~~ **determining, comparing, and calculating** steps are performed by a computer, and further comprising the step of displaying the results of at least one of the**se** ~~calculating~~ steps on a computer display.

8.   (Currently Amended) The method of Claim 1, wherein the ~~combustion~~ **compression** pressure is measured at a crank angle of approximately 160 degrees.

9.   (Currently Amended) A method of balancing combustion among cylinders of an internal combustion engine, comprising the steps of:

measuring the peak firing pressure within each cylinder;

measuring the ~~combustion~~ **compression** pressure within each cylinder;

for each cylinder, calculating its associated normalized peak firing pressure (NPFP) as the ratio of its peak firing pressure to its ~~combustion~~ **compression** pressure;

determining a balancing NPFP, the balancing NPFP being between the smallest calculated NPFP and the largest calculated NPFP, thereby determining a target NPFP for the engine;

comparing the target NPFP to the NPFP for each cylinder; and

calculating a fuel flow adjustment to any cylinder whose NPFP is not substantially equal to the target NPFP; and

adjusting the fuel flow in accordance with the calculating step.

10.   (Original)   The method of Claim 9, wherein the method is performed automatically by an embedded engine control unit.

11.   (Original)   The method of Claim 9, wherein the method is performed automatically by a computer system in electronic communication with fuel control valves or injectors.

12.   (Original) The method of Claim 9, wherein the adjusting step is limited and further comprising the step of repeating the measuring, calculating, comparing, and adjusting steps until the NPFP of each cylinder is substantially equal to the target NPFP.

13.   **(Currently Amended)**   An interactive computer system for balancing combustion among cylinders of an internal combustion engine, each cylinder having an associated pressure sensor, comprising:

a processing system for receiving pressure measurements from the pressure sensors; for determining the peak firing pressure and the ~~combustion~~ **compression** pressure within each cylinder; for calculating each cylinder's associated normalized peak firing pressure (NPFP) as the ratio of its peak firing pressure to its ~~combustion~~ **compression** pressure; for **determining a balancing NPFP, the balancing NPFP being between the smallest calculated NPFP and the largest calculated NPFP, thereby** determining a target NPFP for the engine; for comparing the target NPFP to the NPFP for each cylinder; and for calculating fuel control adjustment values based on the comparing step;

a computer display for displaying the fuel control adjustment values.

14.   (Original)   The system of Claim 13, wherein the display further displays pressure measurement values.

15.   **(Currently Amended)** An automated combustion balancing system for balancing combustion among cylinders of an internal combustion engine, each cylinder having a pre-combustion fuel control valve, comprising:

a pressure sensor associated with each cylinder for measuring the peak firing pressure and the ~~combustion~~ **compression** pressure within each cylinder; and

a processing system for calculating each cylinder's associated normalized peak firing pressure (NPFP) as the ratio of its peak firing pressure to its ~~combustion~~ **compression** pressure; **determining a balancing NPFP, the balancing NPFP being between the smallest calculated NPFP and the largest calculated NPFP, thereby** determining a target NPFP for the engine; comparing the target NPFP to the NPFP for each cylinder; and providing a control signal to the fuel flow valve to each cylinder, such that the fuel flow to any cylinder whose NPFP is not substantially equal to the target NPFP is adjusted; and

fuel control valves associated with each cylinder.

16.   (Original) The system of Claim 15, wherein the processing system is part of an engine control unit.

17.   **(New)** The method of Claim 1, wherein the step of determining an equalizing NPFP is performed such that it represents a condition in which the air-fuel ratio among the cylinders is equalized.

18.   **(New)** The method of Claim 1, wherein the calculating step is based on an averaging technique of the cylinders' NPFP values.

19.   **(New)** The system of Claim 13, wherein the target NPFP is the mean of the NPFP values calculated in the calculating step.

20.   **(New)** The method of Claim 13, wherein the step of determining an equalizing NPFP is performed such that it represents a condition in which the air-fuel ratio among the cylinders is equalized.

21.   **(New)** The method of Claim 13, wherein the calculating step is based on an averaging technique of the cylinders' NPFP values.